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(54) Title: COMPUTERIZED PAYMENT SYSTEM FOR PURCHASING GOODS AND SERVICES ON THE INTERNET

(57) Abstract

A method and system for use on a quasi-public network, such as the Internet, to enable users of the network to conduct commercial transactions involving a payment of funds by one user to another user of the network. The method includes operating a computer system for sending and receiving messages from users over the network. Upon receiving a message over the network from a qualified user-seller, a message is sent over the network to the user-buyer that was identified in the message from the user-seller. The message to the user-buyer requests confirmation of a transaction identified in the message received from the user-seller. Upon receiving a confirmation over the network from the user-buyer, payment information is sent by secure channels off the network to an agent of the user-seller. The user-seller's agent may be a separate entity or the function of the user-seller's agent may be performed by the transaction enabling system. Upon receipt of an authorization code from the seller's agent, the authorization code is encrypted and sent to the user-seller over the network.

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1                    COMPUTERIZED PAYMENT SYSTEM  
2                    FOR PURCHASING GOODS AND SERVICES  
3                    ON THE INTERNET

4                    REFERENCE TO RELATED APPLICATION

5                    This application is related to copending  
6                    application Serial No. 08/308,101, filed September 16,  
7                    1994, the entire disclosure of which is hereby  
8                    incorporated by reference herein.

9                    BACKGROUND OF THE INVENTION

10                  The present invention relates to a system for  
11                  enabling payment for goods and services over a quasi-  
12                  public network, and more particularly, the present  
13                  invention relates to a payment system that can be used to  
14                  enable an Internet user to initiate a payment to another  
15                  Internet user for goods or services over the Internet.

16                  The Internet has emerged as a large community  
17                  of electronically-connected users located around the  
18                  world who readily and regularly exchange significant  
19                  amounts of information. The Internet continues to serve  
20                  its original purposes of providing for access and  
21                  exchange of information among government agencies,  
22                  laboratories, and universities for research and  
23                  education. In addition, the Internet has evolved to  
24                  serve a variety of interests and forums that extend  
25                  beyond its original goals.

26                  The Internet has been considered as a potential  
27                  new marketplace for various types of products, including  
28                  goods and services. Using the Internet as a marketplace  
29                  has many advantages. Although the Internet presently has  
30                  the capability to serve as a marketplace for goods and  
31                  services, use of the Internet for this purpose has been  
32                  slow to develop. One reason for this lack of development  
33                  is that it is difficult to pay for goods or services  
34                  using the Internet. An Internet user cannot send cash or  
35                  a check via the Internet. Sending a check via physical

1 delivery services is slow and sending a credit card  
2 number over the Internet poses security problems.

3 In the aforementioned patent application,  
4 Serial No. 08/308,101, there was disclosed a payment  
5 system that enabled payment on a quasi-public system,  
6 such as the Internet. The payment system described in  
7 the referenced application is useful for enabling payment  
8 for a variety of products and services, especially for  
9 information products that can be delivered electronically  
10 over the network without physical packaging. Information  
11 products include software, stories, cartoons, recipes,  
12 etc.

13 The aforementioned payment system has proven  
14 successful. However, there continues to be a need for a  
15 payment system for users of the Internet who have  
16 products to vend. Such products include goods and  
17 services that could be as diverse as clothing, computer  
18 hardware, technical support and advice, groceries,  
19 educational courses and training, etc. These types of  
20 goods and services are not necessarily capable of being  
21 transmitted electronically over the network. Such  
22 products may also include information products, as  
23 described above. Since the Internet provides a medium  
24 for users who have all these types of products to sell to  
25 reach users who have an interest in purchasing these  
26 types of products, it would be advantageous if a system  
27 were available for willing users to enter into  
28 transactions with other users for the purchase of these  
29 goods and services.

30 Accordingly, there is a need for a system that  
31 enables users of the Internet to enter into commercial  
32 transactions for goods and services.

33 SUMMARY OF THE INVENTION

34 According to a first embodiment of the present  
35 invention, there are provided a method and payment system  
36 for use on a quasi-public network, such as the Internet,

1 to enable users of the network to conduct commercial  
2 transactions involving a payment of funds by one user to  
3 another user of the network. The embodiment includes  
4 operation of a computer system for sending and receiving  
5 messages from users over the network. Upon receiving a  
6 message over the network from a qualified user-seller, a  
7 message is sent over the network to the user-buyer that  
8 was identified in the message from the user-seller. The  
9 message to the user-buyer requests confirmation of a  
10 transaction identified in the message received from the  
11 user-seller. Upon receiving a confirmation over the  
12 network from the user-buyer, payment information is sent  
13 by secure channels off the network to an agent of the  
14 user-seller. Upon receipt of an authorization code from  
15 the seller's agent, the authorization code is  
16 cryptographically signed and sent to the user-seller over  
17 the network.

18 BRIEF DESCRIPTION OF THE DRAWINGS

19 Figure 1 is a block diagram illustrating a  
20 payment system according to a first embodiment of the  
21 present invention.

22 Figure 2 is a block diagram of a hardware  
23 configuration for the payment system of Figure 1.

24 Figure 3 is a block diagram of the program  
25 arrangement of the payment system of Figure 1.

26 Figure 4A is a diagram of the data fields for a  
27 buyer's cardholder account for use with the payment  
28 system of Figure 1.

29 Figure 4B is a diagram of the data fields for a  
30 seller's account for use with the payment system of  
31 Figure 1.

32 Figure 5 is a flow chart showing message flow  
33 for an payment request using the payment system of  
34 Figure 1.

35 Figures 6A-6F are diagrams of data messages  
36 used in connection with the payment system of Figure 1.

1           Figure 7 is a flow chart showing the message  
2       flow for an payment query and a payment response using  
3       the payment system of Figure 1.

4           Figure 8 is a flow chart showing the message  
5       flow using the payment system of Figure 1 for  
6       communication with the seller's agent.

7           Figure 9 is a flow chart showing the message  
8       flow for sending an encrypted authorization code to the  
9       seller using the payment system of Figure 1.

10          DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

11          I.    OVERALL SYSTEM

12          Figure 1 shows a block diagram of a first  
13       embodiment of the present invention for a payment  
14       system 10. The payment system 10 is shown in relation to  
15       the Internet network 12. The Internet network 12 is a  
16       large, quasi-public network having many users 14. The  
17       Internet network 12 is of a type that the users 14 can  
18       access by various means such as dedicated communication  
19       links or conventional commercial telephone systems. The  
20       Internet network 12 provides numerous services for its  
21       users such as e-mail, FTP, and the World Wide Web (WWW).  
22       Although the payment system 10 is specifically useful for  
23       the Internet, it may be used in conjunction with other  
24       having a plurality of users that can communicate with  
25       each other by e-mail.

26          In the embodiment of Figure 1, one of the users  
27       14 (designated as a buyer 20) wishes to acquire goods or  
28       services 26 from another of the users (designated as a  
29       seller 28). The seller 28 may be any user with a product  
30       or service to vend. The goods or services may include  
31       anything that can be sold for value, such as clothing,  
32       appliances, computers, automobiles, technical advice,  
33       consulting, and so on. The goods or services may also  
34       include information products that can be transferred  
35       electronically over a network, such as the Internet.

1                 The seller 28 wishes to sell goods or services  
2         26 to the buyer 20 at a price. The price may be an  
3         advertised price (e.g. advertised over the Internet, on a  
4         bulletin board, or other media), or may be a negotiated  
5         price (e.g. negotiated via message or e-mail exchange  
6         over the Internet). Although the example of Figure 1  
7         describes one seller 28 and one buyer 20, the payment  
8         system 10 is understood to extend to include multiple  
9         buyers of one seller, multiple sellers to one buyer, and  
10         multiple sellers and multiple buyers. Also, a buyer or a  
11         seller may be an individual, a company, or an  
12         institution.

13                 Also shown in Figure 1 is a financial  
14         transaction settlement system 30. The financial  
15         transaction settlement system 30 represents presently-  
16         available commercial institutions that process credit and  
17         other financial transactions. For example, the financial  
18         transaction settlement system 30 may represent  
19         commercially available credit card processing  
20         institutions (e.g. Visa, Master Card, Discover, and so  
21         on). The financial transaction settlement system 30  
22         includes two components: an issuer 32 and an acquirer 34.  
23         The issuer 32 includes banks, or other institutions, that  
24         issue credit cards to persons, send statements and bills  
25         to credit card holders on a regular basis, and collect  
26         payment from the credit card holders. These functions  
27         are not performed on the Internet but use conventional  
28         mail delivery, authorized direct withdrawals from bank  
29         accounts, etc.

30                 The payment system 10 of the present embodiment  
31         utilizes these commercially available issuers 32 to bill  
32         users and to collect payment from users for their  
33         transactions on the Internet 12 using the payment system  
34         10. For example, a user's transactions that are  
35         initiated using the payment system 10 would show up on  
36         the user's credit card statement as a charge from the  
37         seller 28.

1           As mentioned above, the financial transaction  
2 settlement system 30 also includes the acquirer component  
3 34. This acquirer component 34 includes banks or other  
4 institutions that provide merchant accounts for entities  
5 that want to receive payment for the sale of goods or  
6 services. These merchant accounts are similar or  
7 identical to the conventional merchant accounts that are  
8 provided to businesses. As mentioned below, the acquirer  
9 34 processes the user charges received from the payment  
10 system 10 and passes this information to the issuer  
11 component 32 for the preparation and sending of monthly  
12 statements and bills to users and collecting payment from  
13 users.

14           The payment system 10 includes two distinct  
15 parts or systems: an above-the-line system 40 and a  
16 below-the-line system 42. The above-the-line system 40  
17 and the below-the-line system 42 are separated by a  
18 "line" or "firewall" 44. The line 44 isolates the above-  
19 the-line system 40 from the below-the-line system 42.  
20 The line 44 permits limited communication between the  
21 above-the-line system 40 and the below-the-line system 42  
22 but prevents unauthorized access to the below-the-line  
23 system 42 through the above-the-line system 40. The line  
24 44 provides security for the information contained on the  
25 below-the-line system 42 and prevents hackers on the  
26 Internet from entering the below-the-line system 42 via  
27 the above-the-line system 40.

28           Figure 2 is a block diagram illustrating one  
29 possible configuration of hardware components used to  
30 implement the payment system 10 of Figure 1. The above-  
31 the-line system 40 includes an above-the-line (or "front  
32 end") computer 50 and the below-the-line system 42  
33 includes a below-the-line (or "back end") computer 52.  
34 The above-the-line computer 50 and the below-the-line  
35 computer 52 are connected together via a private network  
36 53. In a preferred embodiment, the private network is an  
37 Ethernet network. The above-the-line computer 50

1 includes an above-the-line system board 54 associated  
2 with an above-the-line memory 56, a storage device 58  
3 such as a fixed disk drive, a back up tape drive 60, a  
4 removable media drive 62, a monitor 64, and a power  
5 supply 66. The above-the-line computer 50 is connected  
6 to the Internet 12 by means of a leased T1 line 69.

7 The below-the-line computer 52 includes a  
8 below-the-line computer system board 68 associated with a  
9 below-the-line computer memory 70, a below-the-line  
10 computer storage device 72 such as a fixed disk drive, a  
11 back up tape drive 74, a removable media drive 76, a  
12 monitor 78, and a power supply 80. The below-the-line  
13 computer 52 is connected to the above-the-line computer  
14 50 by means of Ethernet cable. The below-the-line  
15 computer 52 also has a Novell LAN 81 that provides a  
16 secure communication link apart from the Internet.

17 Both the above-the-line computer 50 and the  
18 below-the-line computer 52 in this embodiment are  
19 preferably commercially available Sun Microsystems SS1000  
20 computers. Preferably, both the above-the-line computer  
21 50 and the below-the-line computer 52 are equipped with  
22 64 MB memory. As mentioned above, the dedicated private  
23 network is an Ethernet and includes a SBUS host adaptor.  
24 The communication server is a Sun Microsystems  
25 SPARCserver 1000. Both the above-the-line monitor 64 and  
26 the below-the-line monitor 78 are commercially available  
27 Sun 17 inch monitors. The above-the-line and below-the-  
28 line tape drives are Python 5GB tape drives using 4mm  
29 tape available from Sony, Inc. The above-the-line disk  
30 drive 58 and the below-the-line disk drive 72 are  
31 commercially available Seagate 1.7GB disk drives. The  
32 host adaptor is a Sun Microsystems SBUS host adaptor.  
33 The network server is a commercially available Sun  
34 Microsystems SSarray 101. The above-the-line and below-  
35 the-line computers 50 and 52 may be similar or identical  
36 to the front end and back end computers that are

1 described in the aforementioned related patent  
2 application Ser. No. 08/308,101.

3 Referring to Figure 3, the above-the-line  
4 computer 50 runs an above-the-line program 90. The  
5 above-the-line program 90 is a software program that  
6 provides for communication with users 14 on the Internet  
7 12. Specifically, the above-the-line program 90 includes  
8 modules that can be accessed and used by Internet users  
9 who are buyers 20 and Internet users who are sellers 28.

10 The below-the-line computer 52 runs a below-  
11 the-line program 92. The above-the-line program 90  
12 communicates with the below-the-line program 92 via the  
13 private network 53. Thus, the above-the-line program 90  
14 is physically separate and isolated from the below-the-  
15 line program 92. The below-the-line program 92 receives  
16 information from and sends information to the above-the-  
17 line program 90 by means of batch processing. This  
18 comprises, in part, the firewall or line 44 and results  
19 in an inherently safe method of communicating between the  
20 publicly accessible part of the payment system, i.e. the  
21 above-the-line system 40, and the secure part of the  
22 payment system, i.e. the below-the-line system 42.

23 To access the above-the-line program 90 over  
24 the Internet, users 14 who are buyers may use a user  
25 interface software program 118 that can be run on their  
26 own computers for interactive access, or alternatively,  
27 users 14 may access the payment system 90 via  
28 conventional e-mail programs, for store-and-forward  
29 access. Similarly, users who are sellers 28 may access  
30 the above-the-line program 90 over the Internet, by  
31 running an interface software program 119 on their own  
32 computers for interactive access, or alternatively, may  
33 access the payment system 10 via conventional e-mail  
34 program. Programs 90, 118, and 119 may be written in any  
35 suitable programming language, such as Tcl or C. The  
36 software modules are capable of being used with the UNIX

1       operating system, DOS, and may be ported to various other  
2       operating systems.

3       **II. ESTABLISHING BUYERS AND SELLERS ACCOUNTS**

4           In order for a user of the Internet to use the  
5       payment system 10 for transactions as a buyer, the user  
6       obtains a subscriber (or cardholder) account 100 with the  
7       payment system 10. The buyer's cardholder account may be  
8       similar or identical to the cardholder account described  
9       in the related patent application. In order for a user  
10      of the Internet to use the payment system 10 for  
11     transactions as a seller, the user obtains a seller's  
12     account 200 with the payment system 10. Each user may  
13     arrange with the payment system 10 individually to set up  
14     appropriate accounts, or alternatively, a bank may make  
15     arrangements with the payment system 10 to provide  
16     appropriate accounts to a large number of the bank's  
17     customers, such as its credit card customers, as a  
18     enhancement or a promotion. The characteristics of the  
19     buyer's and seller's accounts are set forth as follows:

20           **A. The buyers' accounts**

21           Referring to Figure 4A, there is depicted a  
22       representation of the data in a buyer's cardholder  
23       account 100. The buyer's cardholder account 100 includes  
24       the following information: a cardnumber 102, the  
25       cardholder's name 103, the cardholder's Internet e-mail  
26       address 104, a state 106, and a pay-in selection 108.  
27       These items are explained below. In addition, the  
28       cardholder account 100 may include additional  
29       information, such as a pay-out selection and a currency  
30       preference 112, as disclosed in the aforementioned patent  
31       application.

32           The cardnumber 102 uniquely identifies the  
33       cardholder account 100. The cardnumber 102 is an  
34       alphanumeric string that is easily typed and read by  
35       a human. Also, the cardnumber 102 is relatively hard to

1       guess and bears no deducible relationship to any  
2       financial artifact, such as a credit cardnumber,  
3       a checking account number, nor to any e-mail address.

4              The cardholder's name 103 is the cardholder's  
5       actual name, business name, or an alias.

6              The cardholder Internet e-mail address 104 is  
7       the e-mail address of the cardholder that is unique for  
8       each user of the Internet.

9              The state 106 is one of "active", "suspended",  
10      or "invalid."

11             The pay-in selection 108 is how the cardholder  
12      transfers funds, i.e. makes payment, for use with the  
13      payment system 10. Typically, this may be done by using  
14      a conventional authorization to charge a credit card.  
15      The pay-in selection is not encoded in nor directly  
16      derivable from the cardnumber.

17             Users of the Internet who wish to use the  
18      payment system 10 for the purchase of goods or services  
19      over the Internet may obtain cardholder or subscriber  
20      accounts as described in the aforementioned patent  
21      application, or by making an application to First Virtual  
22      at its web site.

23              B. The sellers' accounts

24             Users of the Internet who wish to use the  
25      payment system 10 as sellers need to be qualified.  
26      Sellers are qualified by establishing a relationship with  
27      an acquiring bank 34 that underwrites the seller 28 for  
28      credit worthiness and that provides the seller 28 with a  
29      merchant account. As shown in Figure 1, an acquiring  
30      bank 34 is part of the settlement system 30.  
31      Establishing a merchant account enables the seller 28 to  
32      act as a merchant and accept credit cards (or credit card  
33      numbers) for payment for goods and services.

34             Referring to Figure 1, when a user becomes  
35      qualified as a seller, the user also establishes a  
36      relationship with a seller's agent 115. The seller's

1       agent 115 is a bank card processor that interacts with  
2       the credit card bureaus 117 such as Visa, Master Card,  
3       etc., that are part of the settlement system 30. The  
4       seller's agent 115 performs the functions of credit card  
5       authorizations and chargebacks. Companies that are now  
6       performing these services include EDS and FDR. For  
7       example, in a conventional credit card transaction at an  
8       retail outlet, after a customer presents a credit card  
9       for payment, the clerk passes the card through a card  
10      reader that makes a call to a bank card processing  
11      company for authorization. The call from the card reader  
12      identifies the card number and the amount of sale. If  
13      the credit card is valid and the amount is within the  
14      credit limits of the card, the seller's agent 117  
15      responds with an authorization code. In the context of  
16      the present embodiment of the payment system, it is  
17      intended that sellers' agents 115 will perform similar  
18      functions as they do now with respect to conventional  
19      credit card transactions. There may be many seller's  
20      agents associated with different sellers, or many of the  
21      sellers may use the same agent. In an alternative  
22      embodiment, the payment system 10 may perform the  
23      function of seller's agent.

24       As mentioned above, a user of the Internet who  
25       wishes to use the payment system 10 to obtain payment for  
26       transactions as a seller of goods or services obtains a  
27       seller's account 200 with the payment system 10.  
28       Referring to Figure 4B, the seller's account 200 includes  
29       the following data: a seller's account cardnumber 202,  
30       the seller's name 203, the seller's Internet e-mail  
31       address 204, and a state 206. These data are similar to  
32       the data in the buyer's cardholder account 100. The  
33       seller's account 200 includes at least one additional  
34       item of data that is not included in the buyer's  
35       cardholder account, that is, the seller's account 200  
36       includes a seller's agent number 219. In addition, the  
37       seller's account may include other information.

1           Referring again to Figure 3, the buyer  
2       cardholder account and seller account information is  
3       distributed in the payment system 10. Only a portion of  
4       the buyer cardholder account and seller account  
5       information resides in the above-the-line system 40 where  
6       it is accessible by the above-the-line program 90.  
7       However, full copies of all the buyers' cardholder and  
8       sellers' account information reside on the below-the-line  
9       system 42 where it is accessible by the below-the-line  
10      program 92. Specifically, the parts of the subscriber  
11      and seller account information that reside on the above-  
12      the-line computer 50 are located in one or more data  
13      files 91 stored on the above-the-line computer storage  
14      device 58. The subscriber and seller account information  
15      that resides on the below-the-line computer 52 is located  
16      in one or more data files 114 stored on the below-the-  
17      line computer storage device 72. The above-the-line  
18      program 90 operates with the database file 91 that is  
19      stored on the above-the-line storage 58 and the below-  
20      the-line program 92 operates with the database file 114  
21      located on the below-the-line storage 72.

22           The items of information in the buyer  
23       cardholder account located in the file 91 on the above-  
24       the-line computer 50 include the subscriber account  
25       number 102, the cardholder's name 103, the Internet  
26       e-mail address information 104, and the state 106.  
27       However, the above-the-line computer 50 does not contain  
28       any of the pay-in 108 information, such as credit card  
29       information, etc., associated with the buyer-subscriber.  
30       Credit card or other payment information is located only  
31       in the data file 114 located on the storage device 72 of  
32       the below-the-line system 42. Similarly, the items of  
33       information in the seller's account 200 located on the  
34       above-the-line system 40 include the seller's account  
35       number 202, the seller's name 203, the seller's Internet  
36       e-mail address information 204, and the state 206 of the  
37       seller's account. However, the above-the-line system 40

1       does not contain the seller's agent number 219. This  
2       information is located only in the data file 114 on the  
3       storage device 72 of below-the-line computer 52.

4       III. METHODS OF OPERATION OF THE PAYMENT SYSTEM

5           As mentioned above, the payment system 10  
6       provides users of the Internet with a means for  
7       initiating a payment transaction, and in particular, a  
8       means for payment for goods or services.

9           It is assumed for purposes of the operation of  
10      the embodiment described herein that the Internet user  
11      who wants to make a payment has already established a  
12      buyer's cardholder account with the payment system, as  
13      described above. Further, it is assumed that the  
14      Internet user who wants to receive payments has  
15      established a seller's account with the payment system,  
16      as described above.

17           Referring to Figure 5, an Internet user (i.e.  
18      the buyer 20) becomes aware of goods or services that the  
19      seller 28 has to vend. This may occur in many different  
20      ways. For example, the buyer 20 may be searching on the  
21      Internet for a seller of the particular product or  
22      service. Alternatively, the buyer 20 may be "browsing"  
23      and happen upon the seller's page. Also, the seller 28  
24      may send messages to a class of Internet users to inform  
25      them of the goods or services that it has to sell. The  
26      buyer 20 may be aware of the seller 28 via advertising,  
27      on the Internet or other media, through others, from a  
28      bulletin board, from a product warehouse on the Internet,  
29      or any other means.

30           The buyer 20 becomes interested in the goods or  
31      services that the seller 28 has to vend and then the  
32      buyer 20 may contact the seller 28 by sending a message  
33      to the seller's Internet address or by an interactive  
34      protocol, e.g. the World Wide Web, FTP, etc. The means  
35      to contact the seller, e.g. the seller's e-mail address  
36      or Web site address, may be included in advertising, etc.

1       The buyer 20 and the seller 28 may partake in an exchange  
2       of messages 107 over the Internet before the buyer 20  
3       decides to purchase the goods or services from the seller  
4       28. For example, the buyer 20 may send messages to the  
5       seller 28 to inquire about product availability,  
6       specifications, options, support, etc. The seller 28 may  
7       respond with appropriate messages over the Internet in  
8       reply to the buyer's inquiries. Also, the buyer and  
9       seller may exchange messages to negotiate a price for the  
10      goods or services. In addition, if the goods or services  
11      that the seller wants to sell are of a type that require  
12      a physical delivery, the buyer and seller may make  
13      appropriate arrangements for such delivery by message  
14      exchange over the Internet.

15           When the buyer 20 decides to buy the goods or  
16       services, the buyer 20 informs the seller 28 of the  
17       buyer's cardnumber 102 by providing an appropriate  
18       message 128 over the Internet 12. The information  
19       included in the buyer's message 128 is represented in  
20       Figure 6A. The message 128 may take the form of an  
21       e-mail message over the Internet 12 that includes the  
22       buyer's cardnumber, or alternatively, the buyer 20 may  
23       inform the seller of its cardnumber 102 by means of  
24       interactive protocols, or by including the cardnumber in  
25       a username in a file transferred from the buyer 20 to the  
26       seller 28 using the Internet 12, or by other means.

27           Referring again to Figure 5, upon receiving the  
28       buyer's message 128 that includes the buyer's cardnumber  
29       102, the seller 28 sends an payment-request message 129  
30       to the payment system 10 via the Internet 12.  
31       Specifically, the seller 28 sends the payment-request  
32       message 129 to the above-the-line program 90 on the  
33       above-the-line system 40. The payment-request message  
34       129 may be sent by either e-mail or by using an  
35       interactive protocol on the Internet 12.

36           Referring to Figure 6B, the payment-request  
37       message 129 contains the following information: the

1       buyer's cardnumber 102, the seller's cardnumber 202, a  
2       textual description 232 of the transaction, an amount  
3       234, a merchant's transaction-identifier 236, and any  
4       physical delivery 237 information for the purchase.

5              After receiving the payment-request message  
6       129, the above-the-line program 90 ascertains whether the  
7       payment-request message 129 is from a qualified seller  
8       28. This is performed by the above-the-line program 90  
9       by checking the database file 91 on the above-the-line  
10      system 40. Upon confirmation that the payment-request  
11      message 129 is from a qualified seller, the payment  
12      system 10 generates a message to ask the buyer 20 whether  
13      the buyer 20 wishes to authorize payment for the  
14      transaction to the seller 28. Specifically, as shown in  
15      Figure 7, the above-the-line program 90 generates  
16      an payment-query message 140 to be sent to the buyer 20  
17      over the Internet.

18              As shown in Figure 6C, the payment-query  
19      message 140 contains the following data: a transaction-  
20      identifier 142, the buyer's name 103, the seller's name  
21      203, the textual description of the transaction 232, and  
22      an amount 235. The transaction-identifier 142 is a  
23      number or code uniquely-generated by the above-the-line  
24      program 90. Using the information contained in the  
25      payment-request message 129 from the seller 28,  
26      specifically the buyer's cardnumber 102 and the seller's  
27      cardnumber 202, the above-the-line program 90 looks up  
28      the buyer's name 103 and the seller's name 203. In the  
29      payment-query message 140, the buyer's name 103 and the  
30      seller's name 203 are used instead of the buyer's  
31      cardnumber 102 and the seller's cardnumber 102 in order  
32      to minimize transmission of the cardnumber information  
33      over the Internet thereby improving security of the  
34      system. The amount 235 sent to the buyer may differ from  
35      in the transaction amount 234 received from the seller to  
36      account for any currency exchange rates or service  
37      charges imposed by the payment system 10.

1                 After generating the payment-query message 140,  
2         the above-the-line system 40 sends the payment-query  
3         message 140 to the buyer's e-mail address and waits for  
4         a response from the buyer 20. The payment-query message  
5         140 requests the buyer 20 to respond with one of three  
6         possible replies: "yes", "no", or "fraud." Thus, there  
7         are four possible alternatives that can occur in response  
8         to the payment-query message 140, taking into account the  
9         three permitted responses by the buyer and the  
10         possibility of no reply.

11                 **1. No reply from Buyer**

12         If there is no reply from the buyer 20 to the  
13         payment-query message 140 after a period of time, the  
14         above-the-line system 40 will send the payment-query  
15         message 140 again, i.e. a second notice. The above-the-  
16         line system 40 may send the payment-query message 140 to  
17         the buyer 20 several times until a response from the  
18         buyer 20 is obtained. If more than a certain number of  
19         days elapses, or more than a certain number of payment-  
20         query messages 140 are outstanding to the buyer 20, and  
21         the above-the-line system 40 does not receive an  
22         appropriate response from the buyer 20, as indicated  
23         below, then the above-the-line system 40 causes the  
24         buyer's cardholder account 100 to become suspended. This  
25         is done by changing the buyer's cardholder state 106 from  
26         "active" to "suspended." The buyer's account 100 may be  
27         reinstated later if an appropriate response is received  
28         and/or the number of outstanding payment-query messages  
29         140 for the buyer 20 drops to less than a certain  
30         threshold. Upon reinstatement, the buyer's account 100  
31         is returned to an "active" state. Further, any  
32         outstanding payment-query messages 140 may be sent again  
33         some time later.

## 1           2.    Buyer responds "no"

2                 Referring to Figure 7, in response to the  
3    payment-query message 140, the buyer 20 may respond by  
4    sending a payment-response message 150 to the above-the-  
5    line system 40 via the Internet 12. As illustrated in  
6    Figure 6D, the payment-response message 150 contains the  
7    following data: the payment system generated  
8    transaction-identifier 142 and an indication 152 of the  
9    buyer's willingness to allow transfer of funds. The  
10   willingness indication 152 is one of "yes", "no", or  
11   "fraud."

12                 The structure of the payment-query message 140  
13    facilitates preparation of the payment-response message  
14    150 by the buyer 20. In the payment-query message 140,  
15    the transaction-identifier 142 is placed in the "subject"  
16    of the payment-query message 140 and the e-mail address  
17    to which the buyer's payment-response message 150 should  
18    be sent (e.g. "response@card.com") is placed in the  
19    "sender's address" of the payment-query message 140.  
20    Many conventional e-mail programs in use on the Internet,  
21    including many older programs, have a feature that will  
22    automatically read the "subject" and "sender's address"  
23    of a received message and format a reply message directed  
24    to the sender's address with the same "subject" as the  
25    received message. If the buyer 20 uses this common  
26    feature to send his payment-response message 150 back to  
27    the payment system 10, the only information that the  
28    buyer 20 will have to add is the willingness indication  
29    152 which is only a one word or one letter reply, (i.e.,  
30    "yes", "no", or "fraud", or "Y", "N", or "F").

31                 If the buyer 20 replies "no" in the willingness  
32    indicator 152, the above-the-line system 40 sends a  
33    payment-result 160 to the seller 28 with a "no"  
34    indication 152. The format of a payment-result message  
35    160 is shown in Figure 6E. A payment-result message 160  
36    contains the following information: the transaction-  
37    identifier 142, the seller's name 203, the buyer's name

1       103, the textual description of the transaction 232, the  
2       amount 235, the negative indication 152 of the buyer's  
3       willingness to allow transfer of funds, and the seller's  
4       transaction-identifier 236 if present in the originating  
5       payment-request message 129. Optionally, the original  
6       transaction amount 234 may also be included. When a  
7       buyer declines to authorize payment, a service charge may  
8       be generated to the buyer 20 by the payment system.

9              Information regarding the buyer's "no" reply in  
10          the payment-response 150 is delivered from the above-the-  
11          line program 90 to the below-the-line program 92 where a  
12          service charge may be added to a settlement queue for the  
13          buyer 20, as discussed in the related application.  
14          Further, if a "no" indication is received more than  
15          a certain number of times in a certain number of  
16          transactions over a certain time period, then the state  
17          106 of buyer's account 100 may become "suspended". This  
18          is to prevent a user from making a practice of ordering  
19          products without authorizing payment for them. If the  
20          buyer's account state 106 becomes suspended, this  
21          information is also transmitted by batch processing from  
22          the above-the-line program 90 to the below-the-line  
23          program 92 so that the cardholder account information on  
24          the below-the-line computer 52 conforms to that on the  
25          above-the-line computer 50.

26              **3. Buyer responds "fraud"**

27              Referring again to Figure 7, if the buyer 20  
28          responds to the payment-query message 140 by sending a  
29          payment-response message 150 to the above-the-line  
30          computer 50 via the Internet 12 that indicates "fraud" in  
31          the willingness indication 152, the payment system 10  
32          changes the state 106 of the buyer's cardholder account  
33          100 to "invalid." A response of "fraud" indicates that  
34          the buyer 20 did not request the goods or services from  
35          the seller 28. The information that the buyer 20  
36          responded "fraud" to the willingness indication 152 is

1       transmitted by batch processing from the above-the-line  
2       program 90 to the below-the-line program 92 so that the  
3       cardholder account information on the below-the-line  
4       computer 52 conforms to that on the above-the-line  
5       computer 50. If the buyer 20 responds "fraud", an  
6       appropriate message is sent to seller 28.

7                  **4. Buyer responds "yes"**

8       If, in response to the payment-query message  
9       140, the buyer 20 responds by sending a payment-response  
10      message 150 to the above-the-line system 40 via the  
11      Internet 12 that indicates "yes" in the willingness  
12      indication 152, the above-the-line program 90 transfers  
13      the transaction information, by batch processing, to the  
14      below-the-line system 52. The information communicated  
15      from the above-the-line system 50 to the below-the-line  
16      system 52 includes the buyer's cardnumber 102, the  
17      seller's cardnumber 202, a transaction number 142, the  
18      amount of the transaction 235, and any physical delivery  
19      information for the purchase.

20       When the below-the-line system 52 receives the  
21      information from the above-the-line system 50, it  
22      associates the identified buyer's cardnumber 102 with the  
23      buyer's payment information. This information is stored  
24      in the data file 114 on the below-the-line storage 72.  
25       The below-the-line system 42 also associates the seller's  
26      account number 202 with the seller's agent number 219  
27      which is also stored on the below-the-line system storage  
28      72.

29       Next, referring to Figure 8, the below-the-line  
30      system 42 communicates with the seller's agent 115  
31      associated with the seller's agent number 219. The  
32      communication 250 to the seller's agent 115 identifies  
33      the seller 203, the transaction amount 235, the buyer's  
34      payment information (such as the buyer's credit card  
35      number), and any physical delivery information for the  
36      purchase. The communication 250 to the seller's agent

1        115 is performed off the Internet on secure communication  
2        channels. The communication 250 requests whether the  
3        seller's agent 115 will authorize a charge of the  
4        indicated amount 235 to the buyer's credit card.

5              If the seller's agent 115 indicates that it  
6        will approve the charge, it sends an authorization code  
7        260 to the below-the-line system 40. Upon receipt of the  
8        authorization code 260, the below-the-line program 92  
9        generates a cryptographic signature for the authorization  
10      code 260. In a preferred embodiment, public key  
11      cryptography is used, such as programs available from  
12      RSA, or PGP. For purposes of security, it is very  
13      desirable to ensure the authenticity of the sender of the  
14      authorization code. Accordingly, public key cryptography  
15      is used to authenticate the sender's message (in this  
16      case, the message of the payment system 10) and is not  
17      necessarily used to prevent someone else from reading the  
18      authorization code.

19              The signed authorization code 262 is batch  
20      processed across the line 44 from the below-the-line  
21      system 42 to the above-the-line system 40. Referring to  
22      Figure 9, upon receipt of the encrypted authorization  
23      code 262 from the below-the-line system 42, the above-  
24      the-line system 40 prepares and sends a payment-  
25      notification 264 to seller 28. The payment-notification  
26      264 may be a plain text e-mail message that includes the  
27      seller's transaction identifier 236 and the  
28      cryptographically signed authorization code 262. The  
29      information included in the payment-notification message  
30      264 is represented in Figure 6F. Upon receipt of the  
31      payment-notification 264, the seller 28 can authenticate  
32      the authorization code 260 using the public key of the  
33      payment system used by the encryption program on the  
34      below-the-line system 42. Upon verification of the  
35      authenticity of the message 264, the seller 28 can  
36      proceed to deliver the goods or services to the buyer 20  
37      using whatever arrangements had been previously made.

1           Further processing of the charges to the  
2       buyer's credit card account and credits to the seller's  
3       merchant account are conducted by the conventional  
4       settlement system 30 off the Internet using secure  
5       communications channels. This isolates the buyer-seller  
6       activity which occurs on the Internet from the financial  
7       and credit activity which occurs off the Internet.

8           If the seller's agent 115 accepts the buyer's  
9       card, the charge is processed in the conventional way in  
10      the credit card system 30 to post the charge to the  
11      buyer's credit card in the usual manner by sending the  
12      appropriate information to the buyer's credit card issuer  
13      32. The buyer's credit card issuer 32 sends the buyer 20  
14      a credit card bill, typically via the postal system. The  
15      credit card bill lists the charge 235 as an item on the  
16      user's credit card bill. The settlement system 30 also  
17      arranges to make a payment to the seller 28. This may be  
18      a transfer from the acquirer-bank 34 to the seller's bank  
19      for direct deposit to the seller's checking account.

20          If the seller's agent 115 refuses to accept the  
21       buyer's credit card number, e.g. the credit card is lost,  
22       stolen, canceled, expired, or the transaction amount  
23       exceeds the card's limit, etc., the seller's agent does  
24       not send an authorization code back to the below-the-line  
25       system 42. Instead, the seller's agent may send a code  
26       indicating refusal of the buyer's card. This information  
27       is similarly batch processed to the above-the-line system  
28       42 and an appropriate message is sent to the seller 28  
29       indicating the lack of authorization. The seller 28 may  
30       then refuse to deliver the goods or services to the buyer  
31       20, or request another card number.

32          The description previously set forth explains  
33       how the payment system can process a charge to the user  
34       using the conventional, commercially available credit  
35       card system. There may be various modifications of the  
36       previously described arrangement that may be utilized.  
37       For example, the issuer bank 32 may process a debit to a

1       bank account of the buyer 20 instead of sending a credit  
2       card bill. Alternately, the issuer bank 32 may send the  
3       buyer a bill (other than a credit card bill) for the  
4       accumulated charges.

5           As mentioned above, the function of the  
6       seller's agent may be performed by the payment system  
7       instead of a separate entity. According to this  
8       alternative, instead of communicating the information  
9       about the transaction (i.e. the seller, the transaction  
10      amount, the buyer's credit card number, physical delivery  
11      information, etc.) to a separate party designated by the  
12      seller as its agent who in turn replies whether it will  
13      approve the transaction, the payment system can perform  
14      this function itself. If this function is performed by  
15      the payment system, it is performed either on the below-  
16      the-line system or on an another entirely separate,  
17      secure system. Like a separate seller's agent, the  
18      payment system would communicate with the appropriate  
19      credit card services to determine whether to authorize  
20      the transaction in the amount identified in the  
21      communication from the above-the-line system. The  
22      payment system would then perform the seller's agent's  
23      function of generating an authorization code. Then, as  
24      in the above-described embodiment having separate  
25      seller's agents, the payment system would generate a  
26      cryptographically-signed message including the  
27      authorization code, send the message to the above-the-  
28      line system, and send the cryptographically-signed  
29      message to the seller over the Internet.

30           The payment system described above is  
31       particularly advantageous for use on networks that do not  
32       have a centralized management authority, such as the  
33       Internet. Other such systems include FIDOnet and  
34       UUCP/Usenet, although it is recognized that these systems  
35       are considered by some to part of or associated with the  
36       Internet. The payment system described above could also

1       be used on future versions, generations, etc., of the  
2       Internet. The payment system could also be used on  
3       centrally managed computer systems, such as America  
4       Online, Prodigy, etc.

5                 The payment system described above enables  
6       Internet users to initiate commercial transactions to buy  
7       and sell goods or services over a quasi-public network,  
8       such as the Internet, regardless of where the users are  
9       located or where the payment system is located. Either  
10      the buyer or the seller may be located in the U.S. or  
11      outside the U.S. Also, some or all of the payment system  
12      components, such as the above-the-line system or the  
13      below-the-line system, may be located either in the U.S.  
14      or outside the U.S.

15                 The foregoing detailed description should be  
16       regarded as illustrative rather than limiting and the  
17       appended claims including all equivalents are intended to  
18       define the scope of the invention.

1       WE CLAIM:

2           1. A method for enabling a seller and a buyer  
3           communicating over a quasi-public network to initiate a  
4           commercial transaction involving a payment of funds by  
5           the buyer to the seller, said method comprising the steps  
6           of:

7           receiving a message over the quasi-public network  
8           from the seller, the seller's message identifying the  
9           buyer and a transaction;

10          sending a message over the quasi-public network to  
11          the identified buyer, said message to the buyer  
12          identifying the transaction;

13          receiving a message over the quasi-public network  
14          from the identified buyer, said buyer's message  
15          indicating acceptance or refusal of the transaction;

16          if the buyer's message indicates approval of the  
17          transaction, communicating to an agent of the seller via  
18          a secure communication channel information for permitting  
19          the buyer to pay for transaction;

20          receiving an authorization code from the seller's  
21          agent via said secure communication channels; and

22          sending a cryptographically-signed message including  
23          the authorization code to the seller via the quasi-public  
24          network.

25           2. The method of claim 1 further comprising the  
26           step of:

27           connecting a computer system to the quasi-public  
28           network, said computer system having a means for sending  
29           and receiving messages.

30           3. The method of claim 1 in which the  
31           cryptographically-signed message utilizes public key  
32           cryptography.

33           4. The method of claim 1 further comprising the  
34           steps of:

1           cryptographically-encoding the authorization code;  
2       and  
3           attaching said cryptographically-encoded  
4       authorization code to the message to the seller.

5       5. The method of claim 1 in which the message  
6       received over the quasi-public network from a qualified  
7       seller is an e-mail message.

8       6. The method of claim 1 in which the message sent  
9       over the quasi-public network to the identified buyer is  
10      an e-mail message.

11      7. The method of claim 1 in which the message  
12      received over the quasi-public network from the  
13      identified buyer is an e-mail message.

14      8. The method of claim 1 in which the message sent  
15      over the quasi-public network to the seller is an e-mail  
16      message.

17      9. The method of claim 1 in which the quasi-public  
18      message is the Internet.

19      10. The method of claim 1 further comprising the  
20      step of:  
21           qualifying users of the quasi-public network as  
22      sellers.

23      11. The method of claim 1 further comprising the  
24      step of:  
25           maintaining a database of account holders who are  
26      users of the quasi-public network.

27      12. The method of claim 11 in which said database  
28      includes information regarding account holders who are

1       qualified as sellers and account holders who are not  
2       qualified as sellers.

3           13. The method of claim 11 in which the database  
4       includes information indicating whether an account holder  
5       is qualified as a seller.

6           14. The method of claim 1 further comprising the  
7       step of maintaining a first system and a second system,  
8                said first system comprising communication  
9       accessible to the quasi-public network, and  
10              said second system comprising communication  
11       accessible to sellers' agents who interface with a  
12       bankcard processing network, and further in which said  
13       method further comprises the step of:  
14                communicating information regarding the  
15       transaction from the first system to the second system,  
16       after approval by the buyer of the transaction.

17           15. The method of claim 1 further comprising the  
18       step of maintaining a first system and a second system,  
19                said first system comprising a first database  
20       of account holders, said account holders being users of  
21       the quasi-public network and including a first group of  
22       account holders who are qualified as sellers and a second  
23       group of account holders who are not qualified as  
24       sellers, and  
25                said second system comprising a second database  
26       of said account holders including information associated  
27       with said second group of account holders including means  
28       by which payment can be made by said second group of  
29       account holders.

30           16. The method of claim 15 further comprising the  
31       step of maintaining a firewall between said first system  
32       and said second system

1           17. The method of claim 1 in which communication  
2       between the first system and the second system is by  
3       batch processing.

4           18. The method of claim 1 in which the transaction  
5       is for goods or services provided by the seller to the  
6       buyer.

7           19. A method of operating a system that enables a  
8       seller and a buyer communicating over a quasi-public  
9       network to enter into a commercial transaction involving  
10      a payment of funds by the buyer for goods or services of  
11      value provided by the seller to the buyer, said method  
12      comprising the steps of:

13          qualifying a first group of users of the quasi-  
14       public network as sellers;

15          maintaining bankcard payment information for a  
16       second group of users of the quasi-public network, said  
17       bankcard payment information maintained on a storage  
18       medium in a secure portion of a computer system;

19          maintaining listings of said first and second groups  
20       of users on a storage medium that is located in a portion  
21       of said computer system that has access to the quasi-  
22       public network, but that is isolated from the secure  
23       portion of the computer system;

24          in response to a message over the quasi-public  
25       network from a user of the first group identifying a  
26       potential transaction with a user of the second group,  
27       sending a message over the quasi-public network to the  
28       identified user of the second group for confirmation;

29          upon receipt of a message over the quasi-public  
30       network from the user of the second group confirming the  
31       transaction with the user of the first group,  
32       communicating bankcard information over secure channels  
33       to an agent of the user of the first group;

1           upon receipt of an authorization code from the agent  
2       via secure channels, cryptographically signing the  
3       authorization code; and

4           sending the authorization code to the user of the  
5       first group via the quasi-public network.

6           20. The method of claim 19 further comprising the  
7       step of:

8           receiving authorization from said first group of  
9       users to act as said agent.

10          21. The method of claim 20 further wherein said  
11       authorization code is generated by said system.

12          22. A system for enabling commerce among users on a  
13       quasi-public computer network, comprising:

14           means for sending and receiving messages to users on  
15       the quasi-public network;

16           means for identifying users who are qualified as  
17       sellers;

18           means for identifying messages received from users  
19       who are qualified as sellers;

20           means for generating messages to users who are  
21       buyers identified in the messages received from the  
22       qualified sellers requesting confirmation of transactions  
23       between said users who are sellers and said users who are  
24       buyers;

25           means for identifying messages from the buyers  
26       indicating confirmation of the transactions;

27           means for isolating the sending and receiving of  
28       messages to and from users from financial information  
29       associated with said users who are buyers for settling  
30       financial transactions;

31           means for sending financial information associated  
32       with buyers via secure channels to agents of sellers  
33       relative to confirmed transactions;

1           means for receiving authorization codes from the  
2        sellers' agents;  
3           means for cryptographically signing the  
4        authorization codes; and  
5           means for generating messages to the sellers  
6        including the cryptographically encoded authorization  
7        codes.

8        23. A method of operating a computer system to  
9        enable users of a quasi-public network to initiate a  
10      commercial transaction involving a payment of funds by  
11      one user of the quasi-public network to another user of  
12      the quasi-public network, the method comprising the steps  
13      of:

14           maintaining a listing of users of the quasi-public  
15        network who are qualified to function as sellers;

16           operating a computer system that is connected to the  
17        quasi-public network, said computer system having a means  
18        for sending and receiving messages from users of the  
19        quasi-public network;

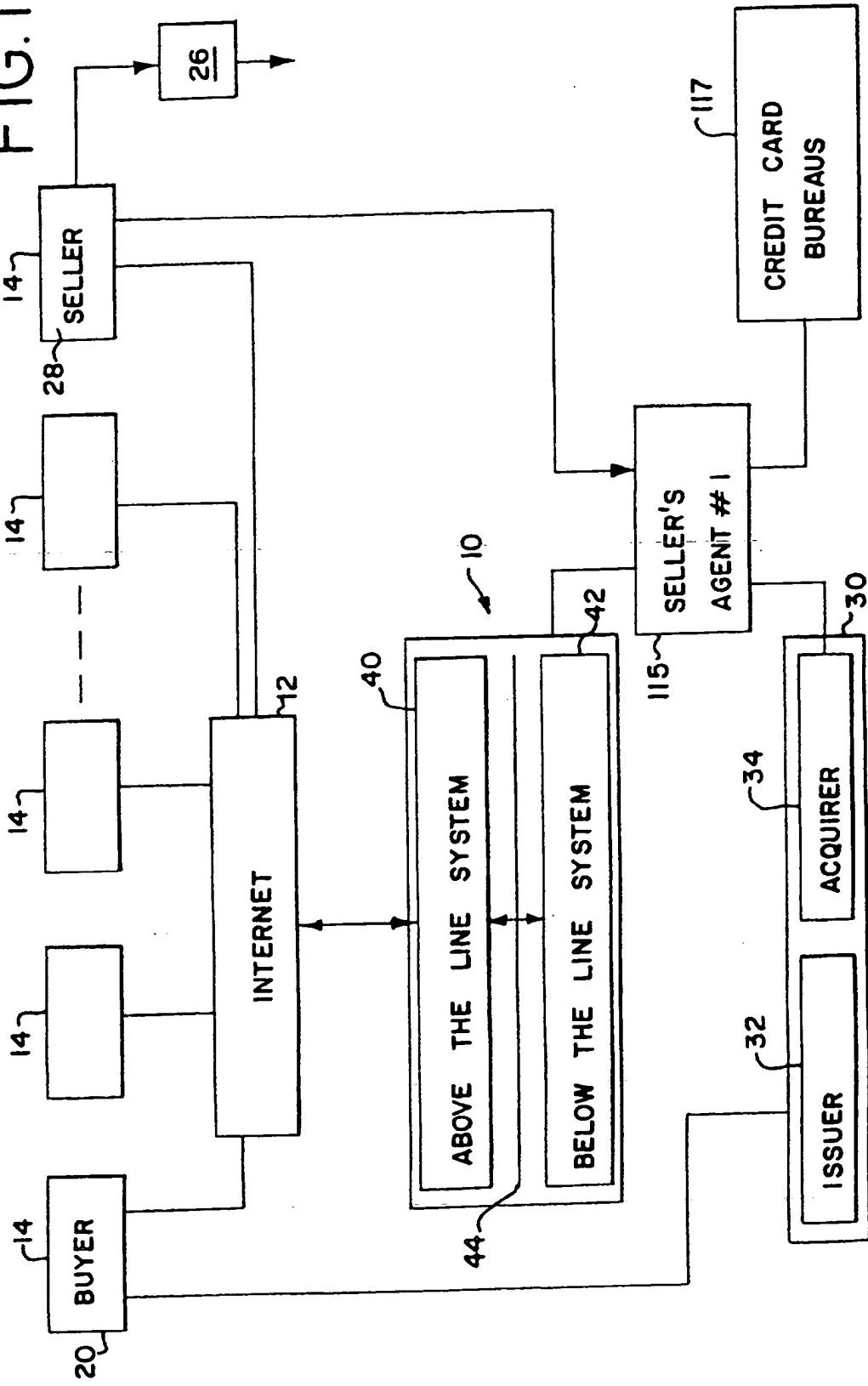
20           upon receipt of a message over the quasi-public  
21        network from a first user of the quasi-public network,  
22        said first user being qualified to function as a seller,  
23        sending a message over the quasi-public network to a  
24        second user of the quasi-public network, said second user  
25        being identified in the message from the first user, said  
26        message being sent to the second user including a request  
27        to confirm a transaction identified in the message  
28        received from the first user;

29           upon receipt of a confirmation of the transaction  
30        from the second user, forwarding payment information of  
31        the second user to an agent of the first user; and

32           upon receipt of an authorization code from the  
33        agent, encrypting the authorization code and sending the  
34        authorization code to the first user.

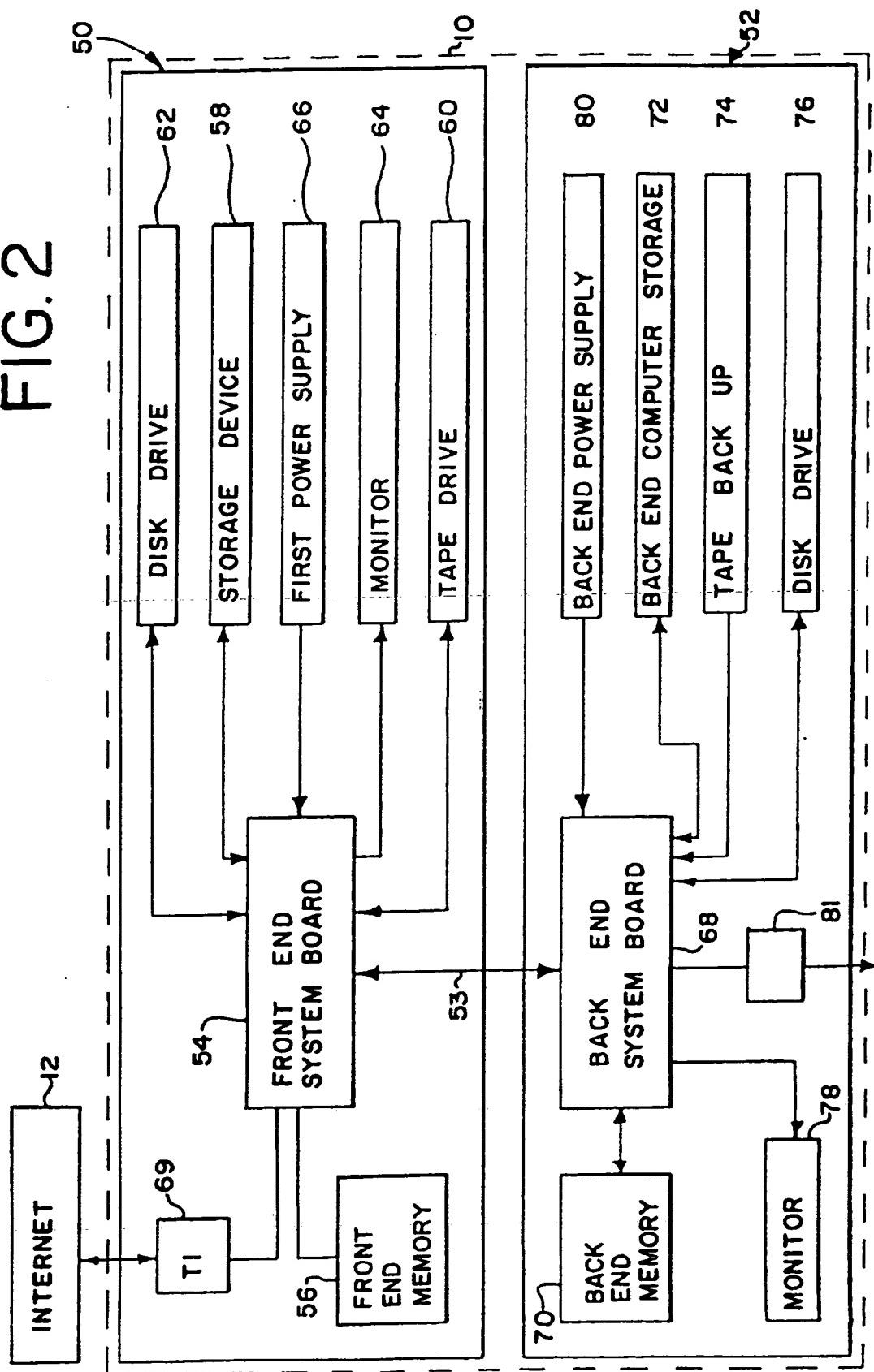
- 1           24. A payment system for use with the Internet
- 2           comprising:
  - 3           qualifying a user as a seller;
  - 4           receiving a message via the Internet from the
  - 5           qualified seller regarding a transaction with a buyer
  - 6           that identifies at least an account identification of the
  - 7           buyer, said account identification maintained by the
  - 8           system;
  - 9           requesting confirmation of the transaction from the
  - 10          buyer by communicating a message to the buyer via the
  - 11          Internet;
  - 12          upon receiving confirmation from the buyer of the
  - 13          transaction from the buyer via the Internet;
  - 14          sending a message off the Internet to an agent of
  - 15          the seller, said message containing information relating
  - 16          to the transaction and payment information for the buyer;
  - 17          receiving confirmation of the transaction from the
  - 18          seller's agent; and
  - 19          communicating an authorization code to the seller.
- 20         25. The method of claim 24 further comprising the
- 21         step of:
  - 22          obtaining authorization from said seller to act as
  - 23          an agent therefor.
- 24         26. The method of claim 25 further comprising the
- 25         steps of:
  - 26          confirming the transaction and payment information
  - 27          as seller's agent; and
  - 28          generating said confirmation as seller's agent.
- 29         27. The method of claim 24 further comprising the
- 30         step of cryptographically signing a message including the
- 31         authorization code communicated to the seller.

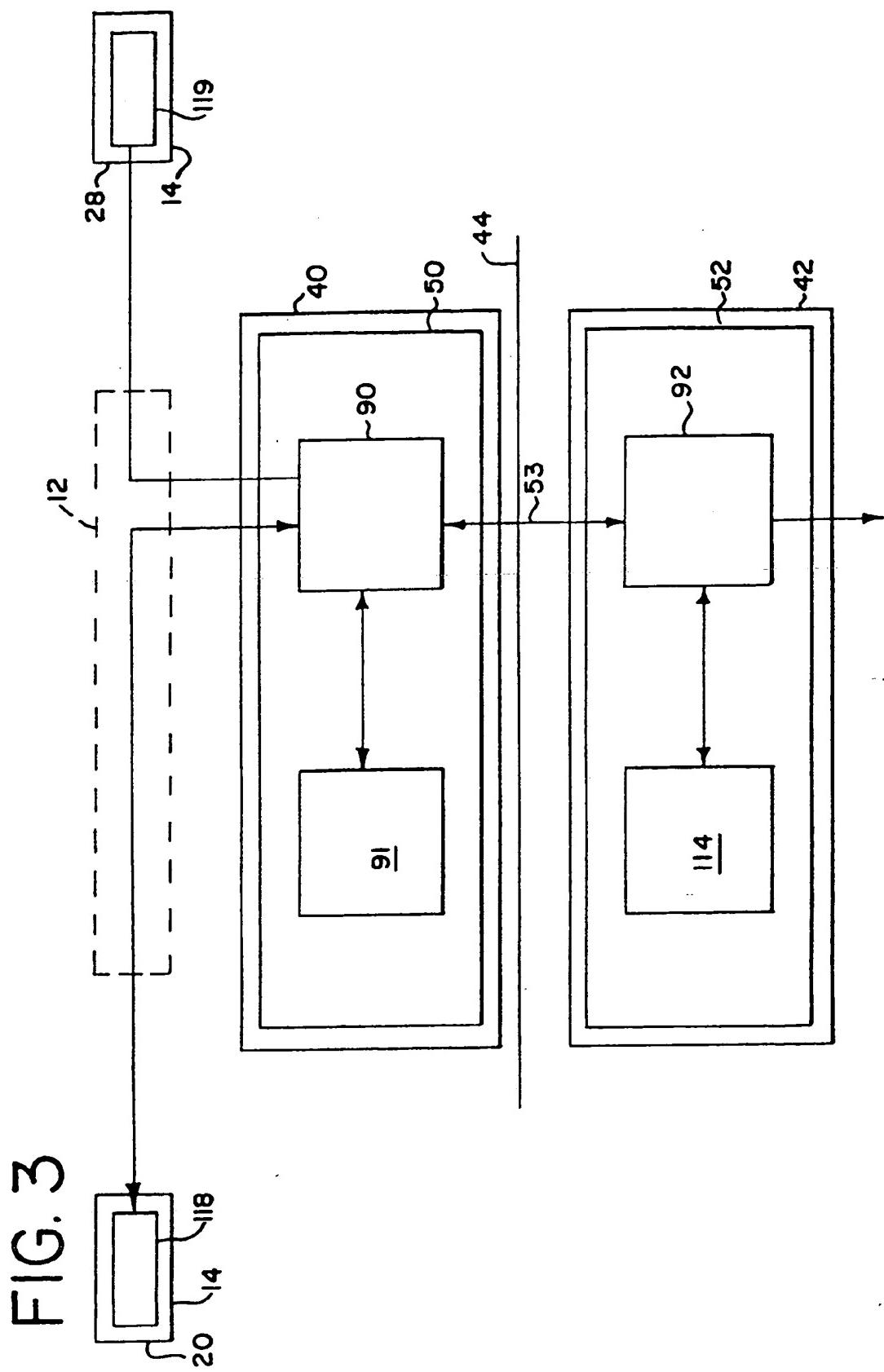
FIG. 1



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FIG. 2





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FIG. 4A

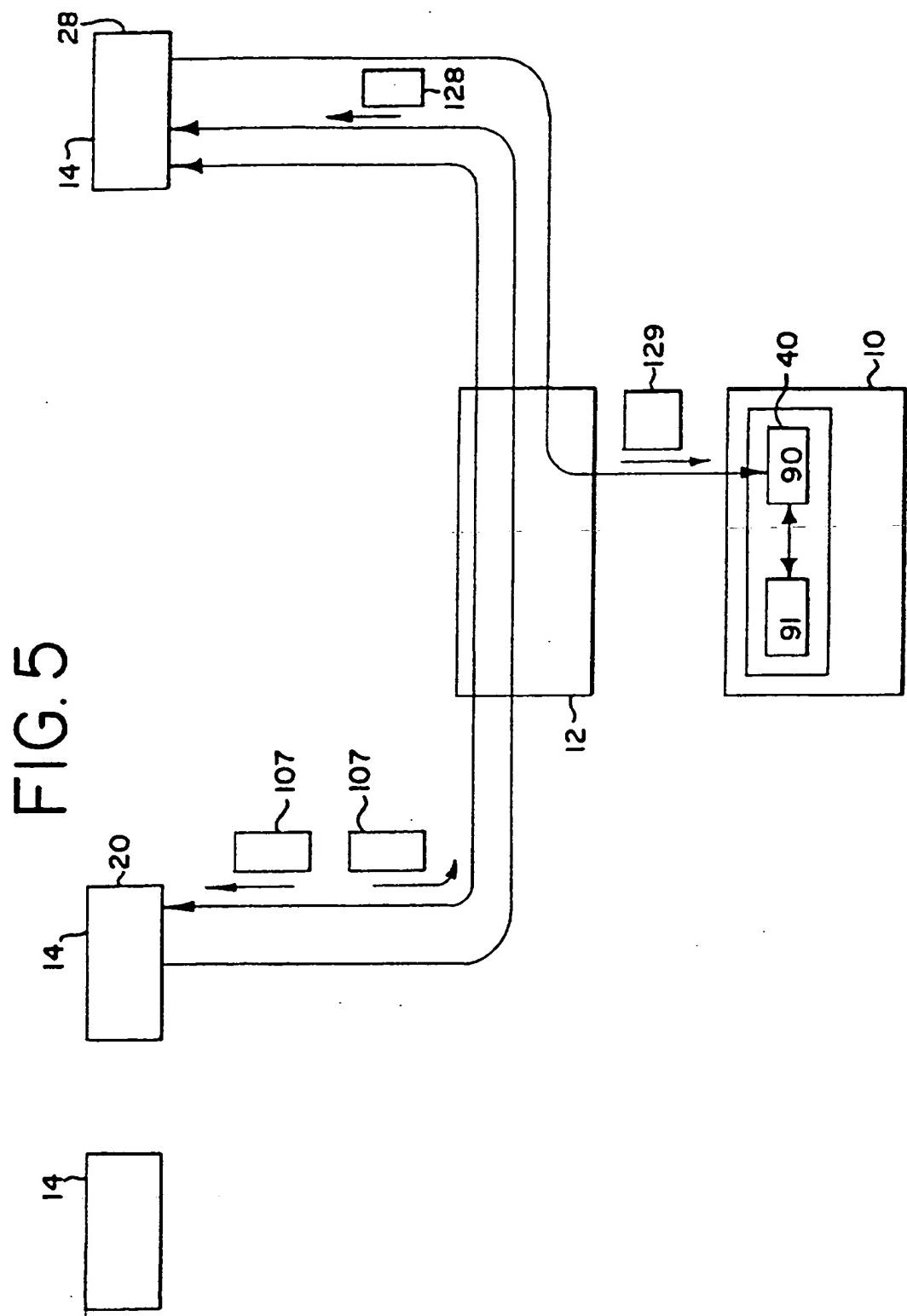
100

CARD HOLDER ACCOUNT	
CARD NUMBER	~102
NAME	~103
INTERNET ELECTRONIC ADDRESS	~104
STATE	~106
PAY-IN SELECTION	~108

FIG. 4B

200

SELLER'S ACCOUNT	
CARD NUMBER	~202
NAME	~203
INTERNET ELECTRONIC ADDRESS	~204
STATE	~206
SELLER'S AGENT	~219



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FIG. 6A

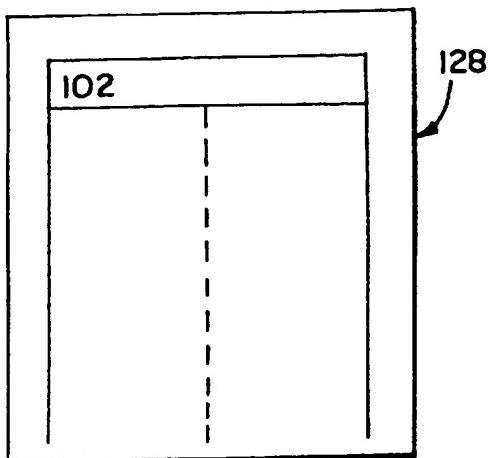


FIG. 6B

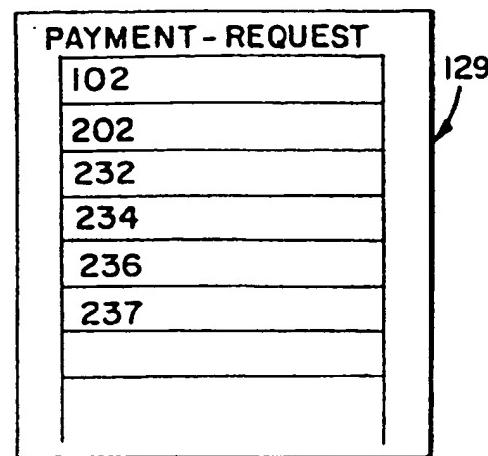


FIG. 6C

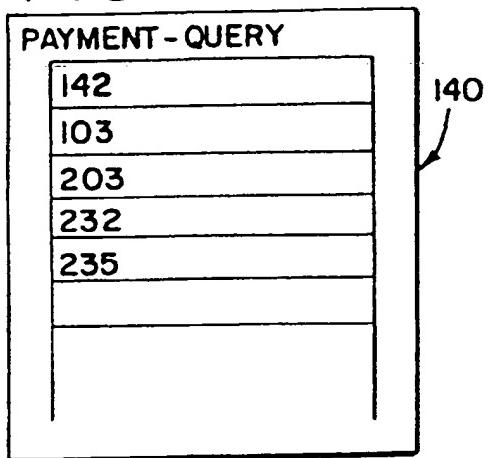


FIG. 6D

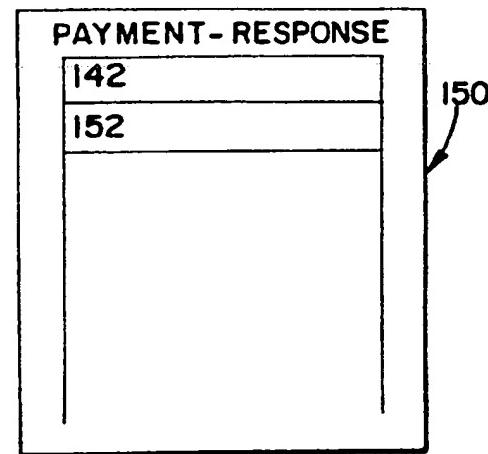


FIG. 6E

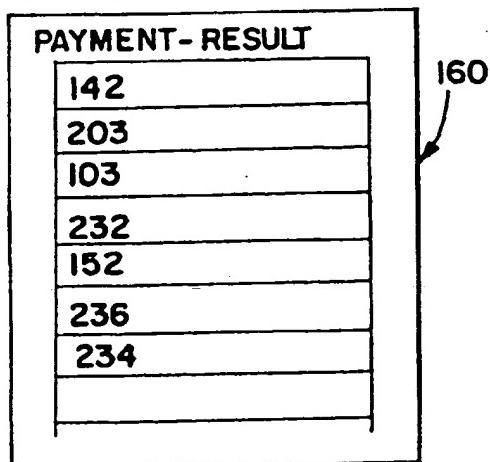
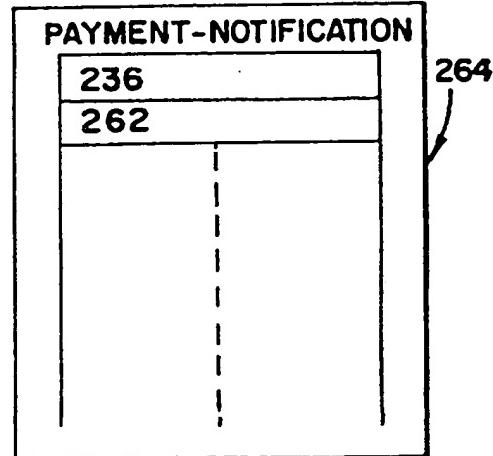


FIG. 6F



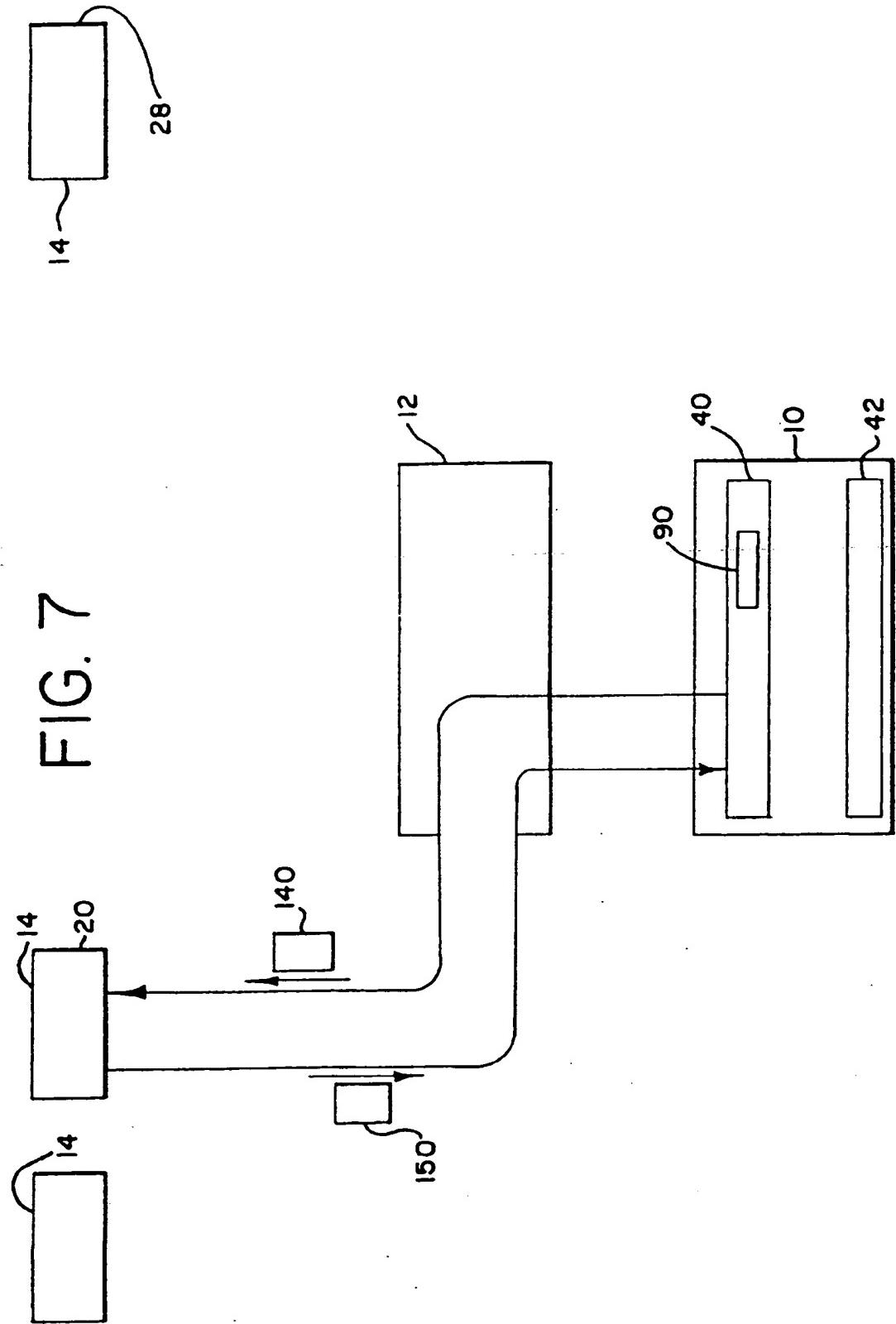


FIG. 7

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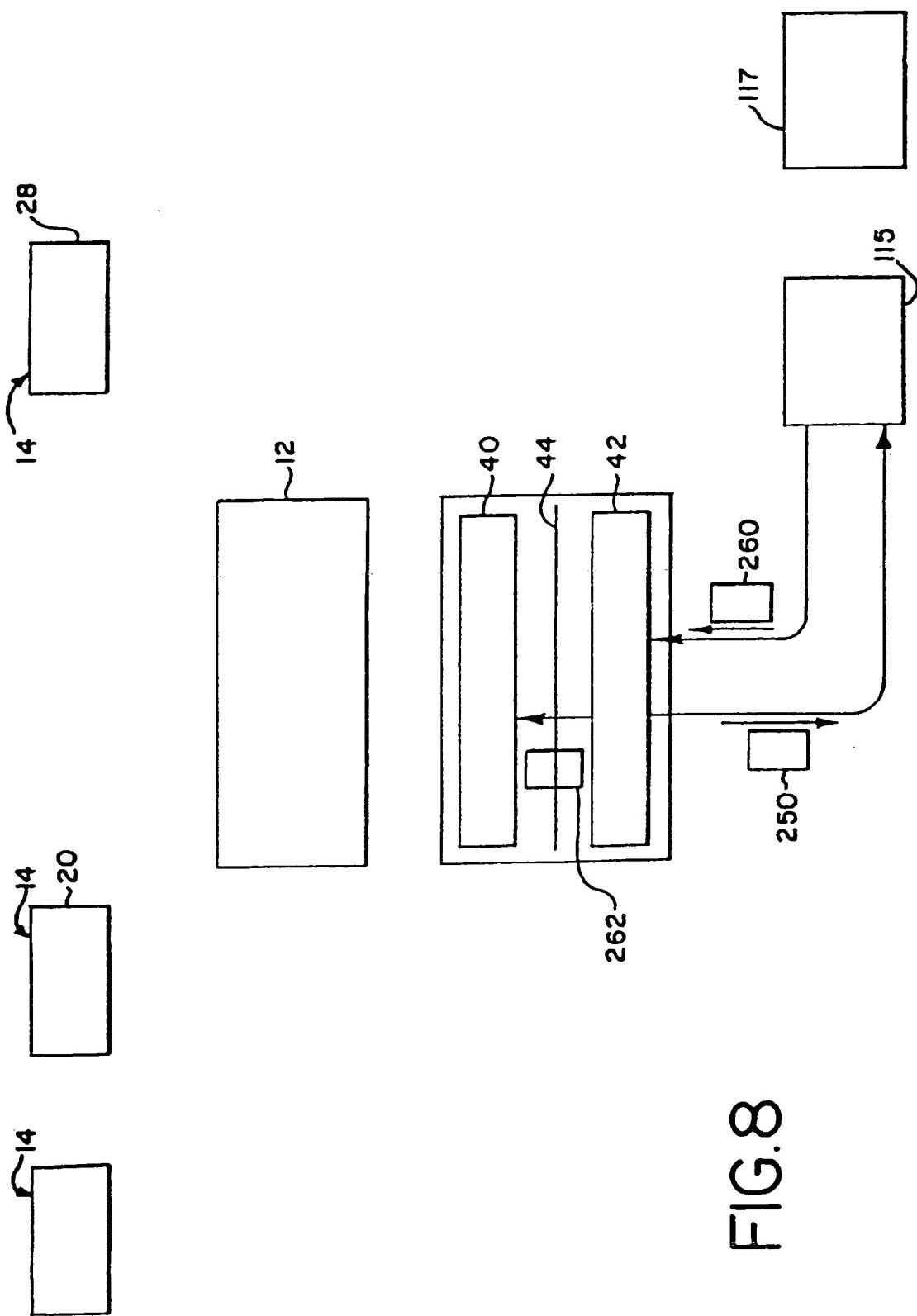


FIG. 8

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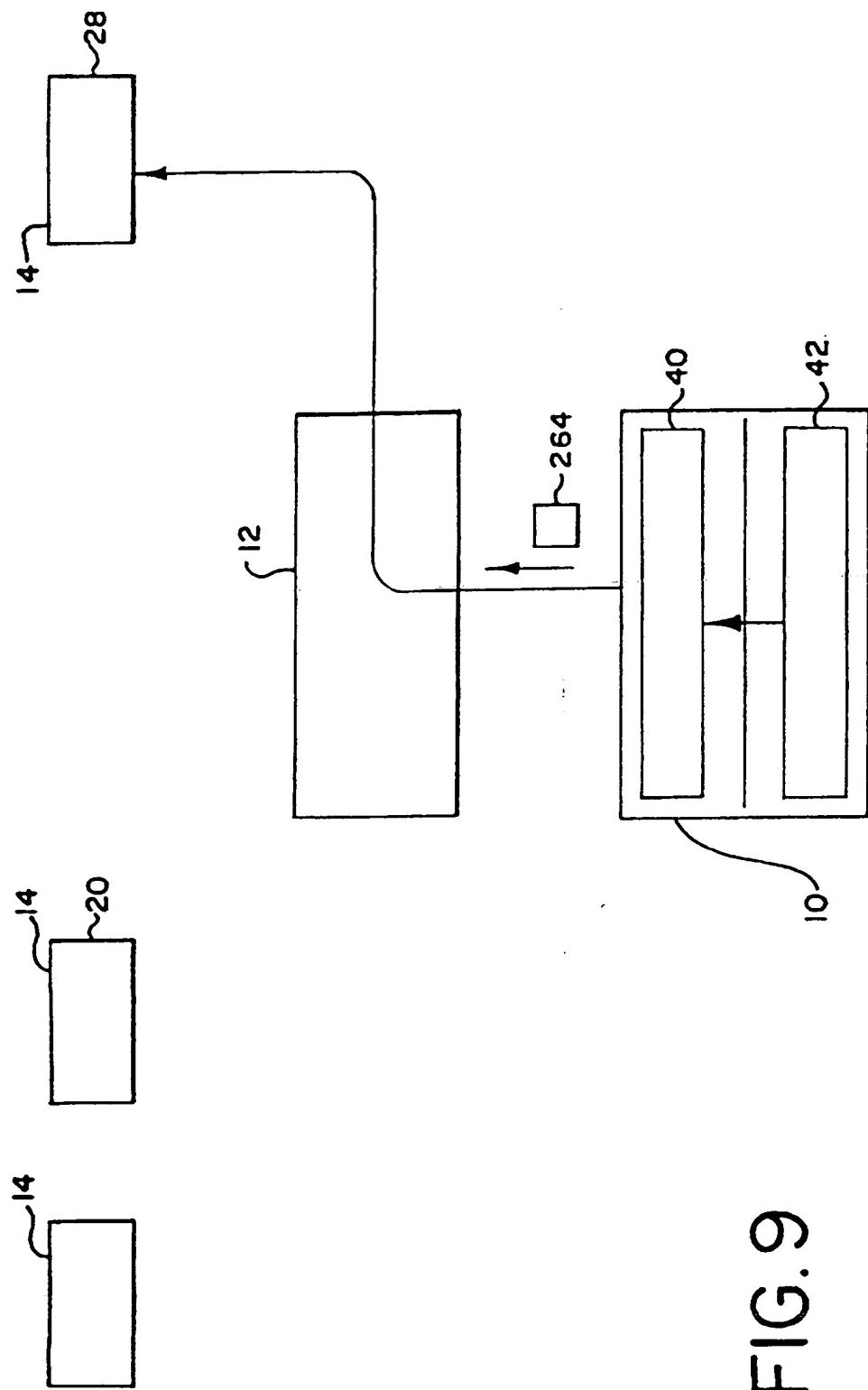


FIG. 9

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